

IN THE DISTRICT COURT OF
JEFFERSON COUNTY, TEXAS
172ND JUDICIAL DISTRICT

JEANNIE GRINNEL, : CIVIL ACTION
INDIVIDUALLY AND AS :
INDEPENDENT EXECUTRIX OF:
THE ESTATE OF WILEY :
GRINNELL, JR., WILEY AND:
FRANCES GRINNELL, SR. :
AND KEVIN GRINNELL :

v.

THE AMERICAN TOBACO :
COMPANY, ET AL. : NO. E-122.878

January 31, 1991.

Oral deposition of CARL SILVER, Ph.D., held
in the offices of Edward F. Mannino & Associates,
1700 One Meridian Plaza, Philadelphia, Pennsylvania
19102, commencing at 10:00 a.m., on the above date,
before Teresa M. Beaver, a Federally-Approved
Registered Professional Reporter and a Commissioner
in the County of Philadelphia.

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 4 Beaumont, Texas 77702
 Counsel for the Plaintiff

5 CHADBOURNE & PARKE
 6 BY: PETER K. ECK, ESQUIRE
 and
 7 THOMAS REILLY, ESQUIRE
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 New York, New York 10112

8 and
 9 ANDREWS & KURTH
 BY: SAM W. CRUSE, JR., ESQUIRE
 and
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 11 Houston, Texas 77002
 and

12 BENCKENSTEIN, OXFORD, RADFORD & JOHNSON
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I N D E X

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1 MR. McCABE: The stipulations will be
2 under the Texas Rules of Civil Procedure.

3 - - -

4 CARL SILVER, Ph.D., having been
5 first duly sworn, was examined and
6 testified as follows:

7 - - -

8 EXAMINATION

9 - - -

10 BY MR. McCABE:

11 Q. State your name.

12 A. Carl A. Silver, S-I-L-V-E-R.

13 Q. Dr. Silver, my name is Roger McCabe. I'm
14 going to take your deposition here today in the case
15 entitled Grinnell versus the American Tobacco
16 Company. You have been listed as a witness for the
17 American Tobacco Company. Have you had your
18 deposition taken before?

19 A. Yes.

20 Q. On how many occasions?

21 A. Probably a dozen.

22 Q. Well, I guess you're probably aware of the
23 general process. I'd like to go over some basic
24 ground rules with you so that we both are operating

Silver

1 under the same assumptions.

2 I'm going to ask you questions and
3 obviously you have to hear and understand my
4 questions before you can give me truthful
5 responses. If you do not understand my question or
6 if you do not hear my question, would you please
7 refuse to answer that question and point out to me
8 that you do not know what I am asking?

9 A. Yes.

10 Q. The court reporter is taking down everything
11 you say and everything I say. It is not possible
12 for her to take down head motions or hand motions.
13 Would you please give me verbal responses to each
14 one of my questions?

15 A. Yes.

16 Q. If you use the phrase uh-huh and um-hum, I'll
17 probably know whether it was affirmative or not as I
18 sit here today but I may not at a later time. Would
19 you please avoid those phrases?

20 A. I'll do my best.

21 Q. If you use those phrases, I'll probably ask
22 you for clarification and that's the reason.

23 I will make every effort not to
24 interrupt your answers in order that the court

Silver

1 reporter can get it in its entirety. Would you
2 please make an effort not to interrupt my
3 questioning for the same reason?

4 A. Yes, sir.

5 Q. Do you know you're under oath? You're
6 required to tell the truth and the penalty for
7 knowingly telling an untruth would be the same as if
8 you did it here or down at the courthouse in front
9 of a judge and jury. Do you understand that?

10 A. Yes.

11 Q. I don't know how long your deposition is
12 going to take. We will take some periodic breaks.
13 If for any reason you want to take a break, tell me
14 so and we can arrange to do so. Do you understand
15 that?

16 A. Yes.

17 Q. You're here with the attorneys who have
18 designated you as an expert. If you desire to
19 consult with them, you may consult with them at your
20 counsel table or outside the room. Do you
21 understand that?

22 A. Yes.

23 Q. Were you provided with the notice of your
24 deposition?

Silver

1 A. Yes.

2 Q. Were you provided with Exhibit A to that
3 notice?

4 A. Could I see that, please? Yes, I was -- I've
5 seen this.

6 Q. What did you bring with you today?

7 A. I have the reports that I generated and the
8 data from which I generated those reports and I
9 think basically that's it in response to that
10 notice.

11 Q. Would you please provide me what you brought?

12 MR. ECK: I believe you already have
13 the reports of Dr. Silver.

14 MR. McCABE: Yes.

15 THE WITNESS: Here they are.

16 MR. McCABE: Mark these three as
17 exhibits, please.

18 (Whereupon, the exhibits were marked
19 Silver-1, 2 and 3 for identification.)

20 BY MR. McCABE:

21 Q. I'm handing back to you what you previously
22 handed to me, having marked them as exhibits;
23 Exhibit Number 1 is a computer printout consisting
24 of 30 pages. Exhibit Number 2 is a printout

Silver

1 consisting of one page and Exhibit Number 3 is a
2 computer printout consisting of two pages.

3 Is that all you brought with you
4 today other than your reports?

5 A. Yes, sir.

6 Q. Does that comply with the Exhibit A and the
7 documents requested in Exhibit A to your Notice of
8 Deposition?

9 A. Yes, it does.

10 MR. ECK: I'd like to let the record
11 reflect that we advised Dr. Silver that materials in
12 the public domain which he had reviewed, some of
13 which plaintiffs were already advised of, need not
14 be brought today.

15 BY MR. McCABE:

16 Q. Do you have your report of December 19, 1989
17 with you?

18 A. I don't, no, but I think counsel has copies.
19 I have a copy now.

20 Q. And in paragraph number two on page one of
21 your report, you state that "In my opinion, the
22 literature and studies reporting the statistical
23 association between cigarette smoking and lung
24 cancer are not sufficient to prove with a reasonable

Silver

1 degree of scientific certainty that Mr. Grinnell's
2 cancer was caused by smoking."

3 What is a statistical association?

4 A. It is a tendency of one variable to change in
5 some systematic way as another variable changes.

6 Q. Did you study the tendency of lung cancer to
7 occur with greater frequency when the human being
8 smokes cigarettes?

9 MR. ECK: What do you mean by greater
10 frequency? Greater than what? I object.

11 BY MR. McCABE:

12 Q. You may answer.

13 A. If your question means have I looked at data
14 which shows a change in the rate at which people die
15 of lung cancer as a function of the amount of
16 smoking of cigarettes, yes, I have.

17 Q. And what did you find when you looked at that
18 data?

19 A. In general, the data support the observation
20 that the more people smoke cigarettes, the
21 greater -- and the more recently they have smoked
22 cigarettes, the greater the likelihood that they
23 will die of lung cancer.

24 A. When I say greater the likelihood, I mean the

Silver

1 risk is larger.

2 Q. And did I understand you correctly to say
3 that the greater the likelihood they would die of
4 lung cancer?

5 A. Yes, sir.

6 Q. Did you make any attempt to determine why
7 this is true?

8 A. No. I've read various speculation ranging
9 from a genetic hypothesis to notions that there's
10 some direct action of cigarette smoke on lung
11 tissue, but it's really outside my field and I'm not
12 competent to make a judgment in those areas.

13 Q. Okay. Did you determine the extent or the
14 magnitude that this was likely to occur?

15 MR. ECK: I object. That's
16 ambiguous. I have no idea what you're asking. I
17 doubt if the witness does, either.

18 THE WITNESS: Counsel, can you be a
19 little more specific with your question? I'll try
20 to be responsive.

21 BY MR. McCABE:

22 Q. You indicated that the data supports the
23 observation that the more people smoke cigarettes
24 and the more recently they smoked, the greater

Silver

1 likelihood that they would die of lung cancer?

2 A. Yes.

3 Q. Did you quantify that likelihood?

4 A. Yes, sir.

5 Q. And in what magnitude or greatness is that
6 relationship?

7 A. Well, to answer that question, you have to
8 give a number of answers. If you're talking about
9 -- my quantification, I mean the quantifications
10 that I have personally looked at, rather than, you
11 know, reading the literature about what other people
12 have done, the magnitude of smoking I divided up in
13 three ways; nonsmokers, what you might call light
14 smokers, that is one to 19 cigarettes a day and the
15 heavy smokers, 20 or more, and I have no doubt that
16 the risk is greater for light smokers than it is for
17 nonsmokers, everything else held constant and the
18 risk seems to be heavier for -- seems to be greater
19 for heavy smokers than for either light smokers or
20 nonsmokers, again with everything else held
21 constant.

22 And for either of the smoking
23 categories, the risk seems to decline pretty
24 steadily any time after a person has quit for a year

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Silver

1 or more. There seems to be -- and I think it's
2 statistically reliable -- a little increase in
3 mortality for people who have quit less than one
4 year. And after that, the -- apparently, the longer
5 it has been since you quit, the less you risk.

6 Q. What data supports your statement that the
7 risk starts to decrease after you have quit smoking
8 for one year?

9 A. Well, in particular --

10 MR. ECK: Are you referring to the
11 analysis that Dr. Silver performed or are you
12 referring to data in the literature in general?
13 Could you be more specific? I mean we know that Dr.
14 Silver performed a specific analysis, which we have
15 before us some of the indicia of that, Exhibits 1, 2
16 and 3 and we also know that he reviewed literature.
17 Are you asking about both?

18 BY MR. McCABE:

19 Q. Do you understand my question, Doctor?

20 A. I would be glad to answer either or both
21 parts of the question, whichever you prefer, that
22 is, whether we're talking about the literature or
23 whether we're talking about my analysis.

24 Q. What literature, what support exists in the

Silver

1 published literature that's available to the general
2 domain, in the general domain, do you rely upon in
3 support of your statement that the risk of lung
4 cancer starts to go down after cessation of one
5 year?

6 A. Well, there's -- for example, data in the
7 1982 surgeon general's report, which tends to show
8 that.

9 Q. Is that the data cited in your report?

10 A. Yes. I cite that in there. Table ten on
11 page 46 and in the 1985 surgeon general's report. *JS*
12 ~~table 70~~ *7 on* page 225 and of course my own analysis tend
13 to show the same thing.

14 Q. Speaking of the published literature, can you
15 cite me to any other published report that you rely
16 upon for your conclusion that the risk of smoking --
17 that the risk of lung cancer goes down after
18 cessation of smoking of one year?

19 A. I guess -- I don't know if you call it a
20 published report -- I certainly heard the surgeon
21 general on television declare that when you stop
22 smoking that your risk decreases and that after, I
23 believe he said something like after ten years, I
24 believe his expression was you have the lungs of a

Silver

1 newborn. So, I guess that would count in some sort
2 of a publication.

3 And although I'm not very good at
4 recalling bibliographic citations, I've certainly
5 read in a bunch of published articles, essentially
6 the same information, that that risk decreases over
7 time after cessation.

8 In fact, I really believe there is
9 no -- I don't think there's any serious disagreement
10 about it.

11 Q. You reference the surgeon general on TV. Are
12 you referring to Surgeon General Koop?

13 A. Yes, Surgeon General Koop, former Surgeon
14 General Koop.

15 Q. Former Surgeon General Koop.

16 As you sit here today, are there any
17 other studies that you specifically recall relying
18 upon in the published literature for the statement
19 that the risk of lung cancer decreases after
20 cessation from smoking of one year?

21 A. I don't recall others by name. I recall the
22 reading, you know, that that's the general consensus
23 in the literature, but I -- there are no others that
24 I can recall at the moment by name.

Silver

1 Of course, I should say that the data
2 that I analyzed, which are American Cancer Society
3 data, have previously been analyzed by Hammond, for
4 example, and he observed in his articles the same
5 thing, but of course that's because he's looking at
6 the same data.

7 Q. In doing your search of the literature, did
8 you find any articles that did not support the
9 proposition that the risk of lung cancer goes down
10 after one year of cessation of smoking?

11 A. Well, I haven't found any that doesn't
12 support the proposition that the risk goes down.
13 I'm not sure that they all talk about one year. The
14 only reason I mention one year is that in my own
15 analyses I see a small -- but I think a real rise --
16 between current smokers and those who quit after one
17 year or, you know, and people one year after
18 quitting is what I should say; which I think is --
19 well, we could discuss -- I mean I'm sure it
20 occurs. We could discuss why it occurs.

21 MR. ECK: Does counsel have an
22 article in mind that you want to ask the witness
23 that --

24 BY MR. McCABE:

Silver

1 Q. I didn't understand your last response.

2 A. I said that the -- what I have seen, I think
3 uniformly supports the proposition that the risk
4 over time of not smoking.

5 I'm not sure how many things I've
6 read talk about the first year and I have observed
7 that there is a rise during the first year and then
8 a fall and I think it's a real rise. I think if we
9 wanted to, we could discuss my not very
10 authoritative opinion on why it occurs. I'm sure it
11 does occur.

12 So, you know, when you're
13 questioning, you were specifically asking about
14 declines after the first year and I just wanted to
15 make sure that what I have seen largely supports the
16 proposition that after you stop smoking, as time
17 passes, risk declines.

18 Q. Okay. But if I understood what you just told
19 me, you were aware the data shows that the risk
20 actually goes up during the first year?

21 A. Yes, that's correct.

22 MR. ECK: Asked and answered.

23 Objection.

24 BY MR. MCCABE:

Silver

1 Q. And what is your reason, your belief as to
2 that?

3 A. As to why it occurs?

4 Q. Yes.

5 A. Well, I suspected -- and I don't have
6 anything more than my own suspicions to back it
7 up -- that this is the result of selection bias,
8 that you've got some people who quit because they
9 found out they are sick and they are sort of locking
10 the barn door a little late. They found out they
11 are sick and they quit smoking and they, of course,
12 represent a population at high risk and it's not
13 surprising that they show high mortality. That's
14 just my guess as to why it happens. But it seems
15 reasonable to me.

16 Q. Then let's go out to five years. Does the
17 literature that you've seen support the proposition
18 that the risk of having lung cancer is higher after
19 five years?

20 MR. ECK: Higher than what? I
21 object. Ambiguous.

22 THE WITNESS: Would you restate your
23 question, please? I think you misspoke.

24 BY MR. McCABE:

Silver

1 Q. Is it your opinion that the published
2 literature supports the proposition that the risk of
3 lung cancer goes down after five years of cessation
4 from smoking?

5 A. Yes, it is.

6 Q. You indicated that there was a rise during
7 the first year?

8 A. Yes, sir.

9 Q. You found no such rise during -- after five
10 years?

11 A. No. On the contrary. I find a substantial
12 reduction.

13 MR. ECK: Those were both asked and
14 answered, by the way.

15 BY MR. McCABE:

16 Q. And what is your support for that statement?

17 A. Well, in my own analyses, I found that for
18 time since quit of five to nine years, the risk
19 ratio is about -- for heavy smokers is about six
20 times that of a nonsmoker, which is it starts off at
21 nearly 16 times that of a nonsmoker.

22 Q. You're referring to one of the exhibits, are
23 you not, Doctor?

24 A. Yes, sir. I'm just looking at my

Silver

1 calculations on the Silver Exhibit 3.

2 Q. Okay.

3 A. This is consistent with what's published in
4 the surgeon general's report in the places that we
5 cited before.

6 Q. All right. Are you familiar with any
7 articles that indicate there is no decline in the
8 risk of lung cancer after five years of cessation
9 from smoking?

10 A. I don't think so, no.

11 Q. Okay. I asked you if you were familiar with
12 articles which showed no decline in the risk of lung
13 cancer after five years of cessation from smoking
14 and you told me that you were aware of none. Is
15 that also true for periods of time greater than five
16 years?

17 A. Yes, sir.

18 Q. Now, back to your Exhibit Number 3. What is
19 Exhibit Number 3?

20 A. Well, Exhibit Number 3 is my calculation of
21 the risk ratios or relative risk for people who
22 have -- who are either nonsmokers or current smokers
23 or who have quit smoking for various periods of
24 time, running from less than one year to more than

Silver

1 15 years.

2 MR. ECK: I'd like to just suggest to
3 the witness he might want to in the description
4 address age and sex.

5 THE WITNESS: This is for -- first of
6 all, this is based on data of the American Cancer
7 Society. It's men only.

8 BY MR. McCABE:

9 Q. What is the data? What is the data base?

10 A. The data base is the American Cancer Society
11 study of one million Americans and in that, I looked
12 at men only, cigarette smokers only and people
13 between the age of 50 and 74 only.

14 Q. 50 and 74?

15 A. Yes.

16 Q. Okay.

17 A. So, this is for nonsmokers, light smokers and
18 heavy smokers.

19 Q. Where did you obtain the data?

20 A. The data were on three rolls of magnetic
21 tape.

22 Q. Where did you get the data?

23 A. Mr. Eck gave them to me.

24 Q. Mr. Eck is the attorney for the American

Silver

1 Tobacco Company with Chadbourne & Parke?

2 A. He's with Chadbourne & Parke, yes.

3 Q. Were you familiar with that data before Mr.
4 Eck gave it to you?

5 A. I had certainly read a lot of reports that
6 were based on that data. I had never had access to
7 the data themselves before but I've read Hammon's
8 report and I read the surgeon general's report and I
9 read a lot of literature that referred to the
10 American Cancer Society study. It's the biggest
11 study, ~~prospective~~ study, probably the biggest study
12 altogether of, you know, relating ~~the~~ smoking and
13 health.

14 Q. How many people were studied?

15 A. About one million.

16 Q. What was the period?

17 MR. ECK: If you recall.

18 THE WITNESS: It was back in the '60s
19 and exactly which years, I don't remember.

20 BY MR. McCABE:

21 Q. And you did a statistical study of that same
22 data?

23 A. Yes, sir.

24 Q. You studied men ages 50 to 74?

Silver

1 A. Yes, sir.

2 Q. May I see Exhibit Number 3. Do you have
3 another copy of that?

4 A. No, sir.

5 MR. McCABE: Off the record.

6 (Whereupon, there was an
7 off-the-record discussion.)

8 BY MR. McCABE:

9 Q. Doctor, we've gotten copies made.

10 A. Counselor, I don't think I've mentioned, you
11 asked about the data for this study and I told you
12 that it was men between certain ages and so on and I
13 think I didn't tell you that it was Caucasians
14 only.

15 Q. Okay. Now, you have prepared an exhibit and
16 it's number three. Is that correct?

17 A. Yes, sir.

18 Q. And my question to you was I think something
19 along the lines of what data have you analyzed to
20 form conclusions concerning the decreases in risk
21 after cessation from smoking over time. Does
22 Exhibit Number 3 address that?

23 A. Yes, sir.

24 Q. What are the first group of numbers that you

Silver

1 have here?

2 A. At the top of the page, under -- the group
3 that's headed age, cat freq and weight and that's a
4 count of the number of white males in each of those
5 age categories in the study, in the ACS data. So,
6 there were 95,744 men between the age of 50 and 54,
7 white men.

8 Q. Is this when they died?

9 A. No, no. That's all the people that were in
10 the study.

11 Q. And they were interviewed?

12 A. They were -- most all of them were
13 interviewed; at least far enough to know that they
14 were -- what their age was and what their race was
15 and what their sex was.

16 Q. And in the next group of data?

17 A. Well, I could say more about that group, if
18 you wanted.

19 Q. There are 281,000 people total?

20 A. There were 281,000 total and the weight is
21 simply the proportion of the frequency of that age
22 divided by the total. So, the 34 -- the point 34 is
23 95744 divided by 281528. That's the proportion.

24 Q. Now, the next group of people are --

Silver

1 A. These are people who said that they never
2 smoked.

3 Q. And between various ages there were X number
4 amount of them that died?

5 A. That is correct.

6 Q. Okay. And the next group are current
7 smokers?

8 A. That is correct.

9 Q. And the number of them that died at a given
10 age?

11 A. Yes, sir. And also the number of person
12 years of such people who were followed during the
13 course of the study is also there.

14 Q. What is the next group?

15 A. The next group is -- TSQ stands for time
16 since quit and that's time since quit less than one
17 year and it's the same information for people who
18 had quit for less than one year at the time of their
19 exit interview or last interview.

20 Q. The number of deaths of current smokers
21 between age 50 and 54 is 183. Is that correct?

22 A. Of current smokers, yes, 183.

23 Q. And the number of deaths between ages 50 and
24 54 of never smoked is 12?

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Silver

1 A. That's correct.

2 Q. Is there any other known variable between
3 those two groups?

4 A. I don't understand what you're asking,
5 counselor.

6 Q. We know that there are -- they are divided by
7 current smokers and never smokers?

8 A. Yes.

9 Q. Do you know of any other reason or criteria
10 for dividing them? Geographic?

11 A. Oh, no.

12 Q. Diet?

13 A. No, no. I didn't divide them on anything
14 else.

15 Q. Now, from those two numbers, can you conclude
16 that if you are a smoker, you are more likely -- you
17 were 15 times or thereabouts more likely to die
18 between ages of 50 and 54 than if you were a never
19 smoker?

20 A. Not from those numbers, no, sir.

21 Q. There are approximately 15 times more deaths
22 in the same age group, are there not?

23 A. Yes, but you're not taking into account the
24 number of people who were followed for how long and

Silver

1 so without doing that, you couldn't draw the
2 conclusion that you're talking about.

3 Q. Did you take into consideration the number of
4 people who were followed and how long?

5 A. Yes, I did.

6 Q. And where is that data?

7 A. It's under person years. If a person -- one
8 person year is one person followed for one year.
9 So, if the person is in the study for six years, you
10 accumulate six person years. If six people are
11 there for six months, you get three person years and
12 so on.

13 Q. Did you do -- again, using the data for
14 people ages 50 to 54, smokers -- never smokers
15 versus current smokers, what do the person years
16 show you?

17 A: There were about 10,000 -- almost 11,000 --
18 let me see. Wait a minute. There's about 108,000,
19 almost 109,000 person years for nonsmokers between
20 the ages of 50 to 54 and for current smokers, the
21 number is about 157,000 person years; about half
22 again more, 50 percent more.

23 Q. Can you use the person years in the data that
24 you have studied in order to determine the risk

Silver

1 factor of dying between ages 50 and 54 with a
2 current smoker versus a never smoker?

3 A. Yes, sir.

4 Q. And what is that risk factor?

5 A. Well, that --

6 MR. ECK: He said it could be done.
7 He didn't say he could do it. Would you lay a
8 foundation?

9 BY MR. McCABE:

10 Q. Did you do that?

11 A. No, sir.

12 Q. Can you do it based upon the information in
13 front of you?

14 A. Yes, sir.

15 Q. And would you please do so and tell me what
16 the risk factor is?

17 A. Well, I don't have a calculator with me but
18 it would be -- well, you see, you asked could I do
19 that with using this information. The answer is
20 yes.

21 There's another piece of information
22 that needs to be used, too, and that's the ~~waiting~~ *missing*
23 factor for the number of people in the study, if
24 you're going to get a reasonable estimate. And to

Silver

1 anticipate your question, yes, I used the ~~waiting~~ *weight*
2 factor. *UAS*

3 MR. ECK: Let's go off record.

4 (Whereupon, there was an
5 off-the-record discussion.)

6 THE WITNESS: Okay. I have done the
7 calculation.

8 BY MR. MCCABE:

9 Q. Before you answer my question, Doctor, would
10 you please tell me what you did?

11 A. Yes. I divided the weight annual rate for
12 current smokers in the age category that you
13 mentioned, 50 to 54, which is .000397 by the weight
14 annual rate for nonsmokers, which is .00038 and that
15 gave me the risk, the appropriately weight risk
16 ratio.

17 Q. And what is that number?

18 A. 10.45.

19 Q. Am I correct in concluding that this data can
20 be interpreted to stand for the proposition that
21 current smokers are ten times more likely to die of
22 lung cancer than never smokers if they are a white
23 male between the ages 50 and 54?

24 A. Under heavy smokers, because these data are

Silver

1 just for heavy smokers, yes, I think that's an
2 accurate statement. Their risk of dying is ten and
3 a half times that of a nonsmoker, dying of lung
4 cancer is ten and a half times that of a nonsmoker.

5 Q. Okay. Moving down to the next category,
6 Doctor, if I understood what you've done, in the
7 ages 55 to 59, what would the risk factor be?

8 A. For which smoking category?

9 Q. Again, never smoked versus current smokers,
10 age group 55 through 59?

11 A. Let's see. It would be about 24.8.

12 Q. 24.8 is rounded off to 25. Am I correct in
13 saying that this data that you've analyzed stands
14 for the proposition that a white male between the
15 ages 55 and 59, that is a current smoker, has a 25
16 times greater chance of dying from lung cancer than
17 a similarly weighted person -- situated person who
18 has never smoked?

19 A. Well, I would say I would agree with that,
20 with the following restriction, that if you look at
21 just one of these subgroups of ages, you are relying
22 on a relatively small amount of data, so there's
23 some uncertainty as to the ratio but as a general
24 proposition, I would say that that's right. I mean

Silver

1 that's what the calculation shows, you know,
2 initially looking at it.

3 MR. ECK: Counselor, there are an
4 awful lot of categories. If you intend to pursue
5 this category by category throughout both pages of
6 the document, if this has some point, other than
7 educating yourself other than as to how the
8 calculations were done, I'd like to know what it
9 is. I don't think this is relevant.

10 BY MR. McCABE:

11 Q. Now, under these categories, Doctor, for the
12 55 through 59 never smoked, there were 89,000 person
13 years?

14 A. In never smoked, 89,000 person years is about
15 right, yes, sir.

16 Q. Under current smokers there were 94,000 plus?

17 A. That's correct.

18 Q. Person years?

19 A. That's correct.

20 Q. Now, you make the statement in your report,
21 Doctor, that there's -- the statistical association
22 between cigarette smoking and lung cancer are not
23 sufficient to prove with a reasonable degree of
24 scientific certainty that Mr. Grinnell's cancer was

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Silver

1 caused by smoking cigarettes.

2 Can there ever be sufficient
3 statistical association to prove causation?

4 A. Well, I don't know that I'm your best witness
5 on this. That is a matter of dispute among
6 philosophers. My own opinion is that you need
7 something more than just statistical association to
8 prove causation. You really have to rule out
9 so-called collinear factors and so that my own
10 opinion is, no, I don't think that no with just
11 statistics, just statistical association you're
12 going to be able to prove causation.

13 But I would say that with regard to
14 the particular statement that I made there, I
15 probably should have made it a little stronger.

16 Q. In what regard?

17 A. Well, I really think -- let me see what I --
18 well, I think I make it more strong in the next
19 paragraph. I say I conclude that pre-1966 smoking
20 was not a measurable risk factor for Mr. Grinnell's
21 lung cancer.

22 I see. Up here. I see there's a
23 difference. Here we're talking about caused by
24 smoking cigarettes. Yeah. Okay.

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1 MR. CRUSE: You've answered his
2 question.

3 THE WITNESS: I think I've answered
4 your question and I think that my answer is that
5 statistics are not going to be able to demonstrate
6 what the cause was in any particular case.

7 BY MR. McCABE:

8 Q. Never?

9 A. Not -- in my opinion, statistics alone can't
10 do it. That's right.

11 Q. Okay. You used the word scientific certainty
12 in your report.

13 A. Yes, sir.

14 Q. Does scientific certainty mean something
15 different than certainty with which people normally
16 make decisions?

17 MR. ECK: I think that's very
18 ambiguous but if you're capable of -- if you're
19 capable of answering it in that form --

20 THE WITNESS: I think I can answer
21 that question. I use the word scientific certainty
22 because people use certainty in at least three
23 senses: There is mathematical certainty, such as
24 the proposition that three times two is six and

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1 which can be proven by a formal exercise.

2 And there is moral certainty, which
3 people say that they have received the word of God
4 or something like that.

5 And then there is a kind of certainty
6 that a person gets by examining empirical data and
7 drawing conclusions about those data with the
8 understanding that human reason has its limitations
9 and any set of data collection can in fact be
10 flawed, but if one takes care to reason carefully
11 and to be scrupulous in the data collection and
12 analysis, then one can have a high degree of
13 confidence in his conclusions, which doesn't
14 guarantee that one is never wrong, of course, but
15 that degree of confidence is what I mean by
16 scientific certainty.

17 Q. Well, does this data show sufficient
18 certainty in order that a reasonable person can act
19 on it in avoiding getting lung cancer?

20 A. Oh, I would say that these data, with regard
21 to the -- what I believe they show, ought to
22 convince any reasonable person that cessation of
23 smoking decreases the risk of lung cancer. I don't
24 think there's any doubt about that.

Silver

1 Q. And continuation of smoking increases the
2 likelihood of lung cancer?

3 A. I'm not sure about -- it certainly maintains
4 the risk and may very well increase it but I really
5 don't have data on that. I mean there is some
6 that's applicable but my analyses don't show
7 something about how current smokers risk changes
8 over time. It just shows that the current smokers
9 risk is high.

10 Q. And does this data show with sufficient
11 certainty that there is a risk association between
12 smoking and lung cancer as to permit medical doctors
13 to advise patients to stop smoking?

14 MR. ECK: I don't see the relevance
15 of that question in terms of Dr. Silver's opinion.
16 He's not a medical doctor, for one thing, and I
17 don't see how it's relevant to his report.

18 THE WITNESS: I don't know about
19 physicians. I think that the data here convinced me
20 that there's a statistical association.

21 BY MR. McCABE:

22 Q. Okay. Would it be with such certainty as, in
23 your opinion, to justify government to take the
24 position that particular continuing smoking

Silver

1 increases the likelihood of lung cancer?

2 MR. ECK: You're pursuing questions
3 outside the doctor's area of expertise.

4 THE WITNESS: First of all, I don't
5 think I understand the question. What do you mean
6 by the government taking the position?

7 BY MR. McCABE:

8 Q. Public health.

9 A. Well, people in public health, like anybody
10 else, I think -- I mean regardless of what field a
11 person is in who looks at this data ought to
12 conclude that smoking cigarettes is a risk factor
13 for lung cancer. I can't see how anybody can avoid
14 that conclusion, whether they are in public health
15 service or whether they are plumbers.

16 Q. And cessation of smoking reduces that risk
17 factor?

18 MR. ECK: Asked and answered.

19 Objection.

20 THE WITNESS: Yes. As time goes by,
21 as the time passes since cessation, the risk
22 declines, yes, sir.

23 BY MR. McCABE:

24 Q. In your report, you indicate or state,

Silver

1 "Furthermore, the data on the risk of lung cancer
2 among ex-smokers are inconsistent with the
3 initiation, promotion or multi-stage models."

4 What is the initiation promotion or
5 multi-stage model?

6 A. Well, there are -- people have tried to make
7 mathematical models, mathematical representations
8 of ~~putative physiological~~ *putative physiological* ~~physiological~~ processes, leading to the
9 generation of cancers. And some of those models
10 that were popular for a while postulate that some
11 substance or event could act as so-called initiator,
12 which started some sequence of events, which might
13 be a ~~physiological~~ *physiological* change in a cell or modification
14 of DNA or something of that nature, although I don't
15 think any of the modelers were specific as to what
16 the change was, they just postulated that there was
17 such a change and that whatever substance or event
18 that it was that caused the change, they called it
19 initiator and that by itself, that was not
20 sufficient to cause a cancer and that, depending on
21 the model, time had to pass and then some other
22 substance or event had to act in such a way as to
23 promote the development of the cancer.

24 But the promotor couldn't have an

Silver

1 effect, unless the cancer had already been initiated
2 and the initiation would not have any consequence if
3 there weren't a subsequent promotor.

4 And these were proposed to act at
5 various stages in the life of an animal and the
6 stages were proposed to, depending on who was doing
7 the modeling, to take varying lengths of time and
8 different models had different numbers of stages and
9 so on.

10 But essentially, that's what the
11 initiation promotion hypothesis is.

12 Q. And you stated that the data on the risk of
13 running cancer among ex-smokers inconsistent with
14 the initiation promotion, what data are you
15 referring to?

16 A. The data that we've been talking about.

17 Q. On your Exhibit Number 3?

18 A. Yes, sir.

19 Q. And what is inconsistent with the initiation
20 promotion?

21 A. Well, those models make no provision for
22 declining risk and they don't have a mechanism in
23 which the declining risk can be systematically
24 accounted for, consistent with the other assumptions

Silver

1 they've made and since we know as a fact that risk
2 does decline, there's got to be something wrong with
3 these models.

4 You know, the very least that a model
5 ought to do is fit the facts.

6 Q. Then the models must be modified?

7 A. Well, they'd probably have to be thrown out
8 altogether and start over. I think that the -- as
9 near as I can tell, there is not a useful model at
10 present.

11 Q. That is not to say that the initiation
12 promotion theory is not correct; is it?

13 MR. CRUSE: That's what he just
14 said.

15 MR. ECK: Asked and answered.

16 MR. REILLY: Mischaracterizes the
17 testimony, too.

18 THE WITNESS: I don't know whether
19 it's correct or not. There's not any evidence for a
20 multi-stage model to support it, in my opinion.

21 BY MR. McCABE:

22 Q. Have you asked Dr. Freedman his opinion?

23 A. I've read articles by Freedman and Devinni.

24 Q. Have you talked with him?

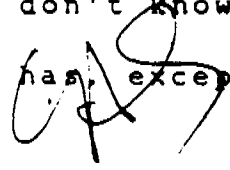
Silver

1 A. No, sir. Never met him.

2 Q. Do you know whether he is of the opinion that
3 the initiation promotion theory is incorrect or the
4 models are not yet accurate?

5 MR. ECK: Objection. He said he
6 hasn't talked with him. Maybe if that is answered
7 in the literature --

8 THE WITNESS: From my reading, all I
9 can really say is that he seems to have at least the
10 opinion that there's no adequate model at present.

11 Now, I don't know whether -- I don't
12 know what opinions he has, except those that I've
13 ~~granted~~ cited 

14 BY MR. MCCABE:

15 Q. Now, you state that the -- that it is well --
16 by the well-documented observations that age of
17 onset of lung cancer in smokers is relatively late
18 in life.

19 What do you mean by relatively late
20 in life?

21 A. Well, most people who get lung cancer get it
22 after the age of 50. In fact, I think some time
23 around 60 is the most -- is the peak period. And it
24 appears to be the time of onset -- the time of onset

Silver

1 seems to be pretty much invariant with other
2 factors. That seems to be for people generally, if
3 they are going to get lung cancer, that's the time
4 when they generally get it.

5 Q. Are you saying that there is no difference
6 between smokers and never smokers on their age at
7 the onset?

8 A. That's roughly correct, yes.

9 Q. What is the effect of side stream smoke on
10 the nonsmokers?

11 MR. ECK: Objection. That's beyond
12 the scope of anything. That assumes facts not in
13 evidence. Even if there were, who knows what
14 effects we're talking about. I think the witness
15 should not answer that question.

16 BY MR. McCABE:

17 Q. You may answer.

18 A. I don't really -- I haven't really read very
19 much in the area. I think the matter is in great
20 dispute and I would be -- I'd be open to hear the
21 evidence on it but I really don't have an opinion.

22 Q. From the point of your qualification --

23 A. Excuse me?

24 Q. From the point of classification of people in

Silver

1 your statistical analysis, do you know how much side
2 stream smoke the alleged nonsmokers were receiving?

3 MR. ECK: Objection. It assumes
4 facts not in evidence, that they were receiving any
5 at all.

6 THE WITNESS: I have no data on
7 that.

8 MR. McCABE: Would that be relevant?

9 MR. CRUSE: To what?

10 MR. ECK: That calls for a legal
11 conclusion.

12 THE WITNESS: Well, I guess it really
13 depends on what it is you're trying to find out. If
14 you're trying to find the difference between smokers
15 and nonsmokers, I suppose it might not have any real
16 value in calculation.

17 If you're trying to assess in some
18 quantitative way what effect tobacco smoke, if any,
19 what effect if any tobacco smoke has, I suppose you
20 might be interested in something like that. But you
21 haven't looked at it and don't know anything about
22 it.

23 BY MR. McCABE:

24 Q. But if you were trying to find out if smoking

Silver

1 is a cause of lung cancer, that might be relevant?

2 MR. ECK: Read that back, please.

3 (Whereupon, the pertinent portion of
4 the record was read.)

5 MR. ECK: What is that? The punitive
6 effect or alleged effect or side-stream smoke? Is
7 that what that is?

8 THE WITNESS: Counselor, I am
9 understanding you to ask the question, would knowing
10 how much side-stream smoke nonsmokers got be
11 relevant for some investigation of causation of lung
12 cancer?

13 BY MR. McCABE:

14 Q. Yes.

15 A. I guess it depends on the investigation. I
16 haven't given enough thought to how one would go
17 about doing this, a causal analysis and I guess
18 sitting here right now, I don't really see how that
19 would fit in the picture.

20 On the other hand, I think I'd like
21 to think about it for a while before I came to a
22 conclusion on the matter. There might be some
23 connection.

24 Q. There might be a statistical difference

Silver

1 whether a nonsmoker as listed in this data lived
2 with a heavy smoker or whether they lived with only
3 other nonsmokers?

4 MR. ECK: There might be --

5 MR. McCABE: Isn't that correct?

6 MR. ECK: I object.

7 THE WITNESS: I don't understand what
8 you're asking me.

9 BY MR. McCABE:

10 Q. In attempting to determine if cigarette smoke
11 causes cancer, there are factors other than whether
12 the person himself is a cigarette smoker and
13 specifically, one of those factors is whether they
14 breathe cigarette smoke of another human being. Do
15 you agree with that?

16 MR. REILLY: Let's have the question
17 again. Read it back.

18 (Whereupon, the pertinent portion of
19 the record was read.)

20 THE WITNESS: Counselor, I'm a
21 biostatistician and I can talk reasonably
22 knowledgeably about factors that are associated with
23 the occurrence of disease. Talking about causes of
24 disease really requires some other discipline, some

Silver

1 medical discipline that I really don't have.

2 If you want to restrict your question
3 to association, I could maybe give you some sort of
4 an informed answer, but I really am not in a
5 position to talk about studies designed to reveal
6 causes of disease.

7 I mean I take it that those things
8 probably involve lab bench studies and stuff, you
9 know, animal studies and things of that nature and
10 I'm not sure what conclusions would be drawn from
11 this side-stream smoke study.

12 I can see where you can look at it as
13 a risk factor. Whether it is a risk factor or not,
14 I don't know, but it could certainly be studied to
15 see if it is.

16 Q. As a biostatistician, do you agree that
17 side-stream smoke may constitute a risk to those
18 people listed as nonsmokers in the data?

19 MR. REILLY: In what data?

20 MR. ECK: In this data?

21 THE WITNESS: You're talking about
22 the ACS study that I used?

23 BY MR. McCABE:

24 Q. Yes, sir.

Silver

1 A. Well, to the extent that some nonsmokers may
2 have been exposed to cigarette smoke from other
3 people, and to the extent to which that has some
4 effect on them, then I would guess they were exposed
5 to -- I would say they were exposed to a risk
6 factor.

7 Now, whether that occurred and to
8 what degree, I have no idea.

9 MR. REILLY: You're making a claim in
10 this case that side-stream cigarette smoke had
11 anything to do with Wiley Grinnell's death? I think
12 Dr. Silver is here to testify about the effect of --
13 Dr. Silver is here to talk about direct smoking and
14 not side-stream smoke.

15 BY MR. McCABE:

16 Q. You indicated that there are documented
17 observations that the onset of lung cancer is
18 insensitive to the duration of smoking cigarettes.
19 Is that one of your conclusions?

20 A. Well, I certainly agree with that. It's not
21 my conclusion but it is the conclusion expressed in
22 several of the surgeon general reports and I
23 certainly have seen no reason to doubt it.

24 Q. I didn't exactly read your paragraph word for

Silver

1 word and I was skipping some words and I was
2 wondering if that is what you are saying in this
3 report?

4 MR. ECK: The report speaks for
5 itself.

6 THE WITNESS: Well, what I said here
7 is that lung cancer -- age of onset is relatively
8 late in life, is insensitive to the duration of
9 smoking.

10 BY MR. McCABE:

11 Q. So, that is your conclusion, that lung cancer
12 is insensitive to the duration of smoking?

13 A. The time of onset, the age of onset; the age
14 of onset is insensitive.

15 Q. So, folks typically get lung cancer after age
16 50?

17 A. Yes, sir.

18 MR. ECK: Objection. Asked and
19 answered.

20 BY MR. McCABE:

21 Q. Is it your opinion that there is an
22 association between the duration of smoking and the
23 number of people who get lung cancer?

24 A. Well, if you'll pardon me, I don't think you

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Silver

1 mean to ask what you're asking.

2 MR. CRUSE: You're not supposed to
3 interpret his questions, like he told you at the
4 beginning. You just answer what he asked. If it
5 doesn't make sense, tell him that.

6 THE WITNESS: I think that the
7 relationship between the number of people who get it
8 and duration of smoking, I'm not sure that there is
9 any such relationship.

10 BY MR. McCABE:

11 Q. Are people who have smoked for 40 years -- do
12 people who have smoked for 40 years have a greater
13 risk of contracting lung cancer than people who have
14 smoked for half that period of time?

15 A. Yes.

16 Q. So the length of time a person smokes
17 increases their risk of getting lung cancer?

18 A. Well, there's an association there, but that
19 association is of course collinear with a lot of
20 other factors; in particular, a person's age. It's
21 pretty hard to straighten out what is due to what.

22 If you ask is there just a gross
23 association between number of years of smoking and
24 the likelihood of getting lung cancer, my answer is

Silver

1 yes.

2 Q. Can you quantify that answer? How much
3 greater?

4 A. Oh, I would have to refer to studies. I
5 don't have a number in my head and I certainly don't
6 have a number net of the age factor.

7 Q. Do any of the data contained on Exhibit
8 Number 1, 2 or 3 deal with that issue?

9 A. No, I don't think so.

10 Q. In your report, Doctor, you have stated that
11 age of onset of lung cancer in smokers, I think what
12 you're saying is insensitive to the number of
13 cigarettes smoked per day?

14 A. Age of onset, yes, sir.

15 Q. Is the number of cigarettes smoked per day a
16 risk factor?

17 MR. ECK: Objection. That's a
18 question -- it makes no sense the way it's worded.

19 THE WITNESS: Well, heavy smokers
20 certainly have a higher risk than light smokers.

21 BY MR. McCABE:

22 Q. Okay. So, it's the age of onset of lung
23 cancer which seems to be insensitive?

24 A. Yes, sir.

Silver

1 Q. But not the magnitude of the risk factor is
2 insensitive?

3 A. No. I never said that.

4 Q. The risk does go up with increased smoking?

5 MR. ECK: Asked and answered.

6 THE WITNESS: Yes, sir.

7 BY MR. McCABE:

8 Q. And the risk goes up with duration of
9 smoking?

10 MR. ECK: Asked and answered.

11 Objection.

12 THE WITNESS: Yes.

13 BY MR. McCABE:

14 Q. And therefore it's your opinion that the data
15 supports the proposition that nonsmokers tend to get
16 cancer at about -- in about the same years of life
17 as smokers?

18 MR. ECK: Objection. Asked and
19 answered.

20 THE WITNESS: There's no doubt about
21 that.

22 BY MR. McCABE:

23 Q. Why is that inconsistent with the causal
24 hypotheses that assumes a latency period?

Silver

1 A. Well, if -- let's suppose you assume that
2 there was a 20-year latency period. Then people who
3 started smoking at age 18 ought to be exhibiting
4 cancer at age 38. Practically nobody exhibits lung
5 cancer at the age of 38. People who start at age
6 nine should be exhibiting it by age 29.

7 If you think a 30-year period is a
8 good number, why people who start smoking at nine
9 ought to exhibit lung cancer at 39; they don't. No
10 matter when they start smoking, they start
11 exhibiting lung cancer at about the same time and
12 that's not -- that's not what is meant by latency
13 period.

14 A latency period is a more or less
15 fixed period of time between exposure and the
16 exhibition of the disease or of death, if you're
17 talking about death.

18 Q. Does that mean there's more than one cause of
19 lung cancer?

20 A. Oh, I don't have any opinion about the cause
21 of lung cancer. I guess -- I mean -- I'm really not
22 an expert on the cause of lung cancer but I know
23 that all sorts of people get lung cancer and I
24 assume for a variety of different reasons. So,

Silver

1 nonsmokers get lung cancer, heavy smokers get lung
2 cancer and I have heard that -- but again, I'm not
3 an expert, radiation produced lung cancer and so
4 on.

5 So, I guess in my naive opinion,
6 there must be a lot of reasons why people get lung
7 cancer, but I'm hardly the guy to ask.

8 Q. You point out that the aging process needs to
9 be accounted for in the theories of lung cancer?

10 A. Sure.

11 MR. ECK: His theories of lung
12 carcinogenesis is what the report says.

13 BY MR. McCABE:

14 Q. You feel that the data supports the
15 proposition that for whatever reason the aging
16 process has something to do with when a person gets
17 lung cancer?

18 A. Well, I certainly know that most everybody
19 gets lung cancer at around the same age, I mean if
20 you're going to get it.

21 Q. If you're going to get it?

22 A. If you're going to get it, yeah, you tend to
23 get it within, you know, a fairly short span of
24 years. I don't know any way to describe that except

Silver

1 that's the function of age.

2 Q. Is that inconsistent with the initiation
3 promotion theories?

4 A. Well, it's inconsistent with the multi-staged
5 models that I've seen and I don't know whether you
6 could make an initiation promotion theory that would
7 incorporate the decreasing -- well, that would
8 incorporate the age process. It seems to me it
9 would be difficult but people are ingenious and
10 somebody might find a way to work it in.

11 Q. But under the initiation promotion models,
12 there are many initiators other than those contained
13 in tobacco smoke; isn't that correct?

14 MR. ECK: Objection. It assumes
15 facts not in evidence.

16 THE WITNESS: I --

17 MR. ECK: There's no testimony that
18 there are initiators in tobacco smoke.

19 MR. ECK: Or that there are even
20 initiators.

21 THE WITNESS: I presume that many
22 have been studied. I can't tell you of my own
23 knowledge.

24 BY MR. MCCABE:

Silver

1 Q. And many promoters?

2 A. I would suppose so but mostly what I have
3 read doesn't discuss what it is that's an initiator
4 and what it is that's a promotor. They simply
5 assume that there is such a thing without naming
6 what it is. And they say, you know, let there be a
7 thing called an initiator and let there be something
8 else called a promotor and I'm not aware -- I mean
9 I'm aware that various people have speculated that
10 various things might fall into one or another of
11 those categories, but the people who deal with the
12 models really are not looking at anything specific
13 in the way of initiators or promoters or at least in
14 my reading. They have a concept that such a thing
15 exists.

16 Q. Have you based your opinion on any
17 unpublished data, other than that which you have
18 presented here today?

19 A. No, sir.

20 Q. What is Exhibit Number 1?

21 A. Well, Exhibit Number 1 is a printout of
22 information from the ACS tapes in which starting on
23 page one we have the accumulated number of cases
24 under the heading N. We have the number of person

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1 years under the heading year-sum. We have the age
2 that the person was at the start of -- when he ^{INAGE}
3 entered the ACS study, under the heading of in age.
4 The smoking history is under past and under I is the
5 level of smoking.

6 And we have this printed out for
7 various combinations of times since quit and smoking
8 history and in age and that runs on through page
9 three. So you cannot get from those the number of
10 people in each category -- well, number of people of
11 the kind we're looking at which are white males with
12 this proper cigarette smoking history and so on and
13 the number of person years that they represent.

14 And then -- well, on page one, I
15 should say page one you've got this for the first
16 breakdown, which goes up to times since quit, up to
17 ten plus years, which you can see down around line
18 45 to 50 or 41 to 50.

19 On page two, and continuing on page
20 three, we have this for the -- for breakdown number
21 two, which is identical with breakdown number one,
22 except that the times since quit is broken down into
23 ten to 14 years and 15 plus, at the bottom of the
24 page, and I might say that the breakdown number one

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1 on page one simply recapitulates Hammond's 1972
2 analysis of these same data.

3 And so breakdown number two just
4 breaks down his ten plus category into ten and 14
5 and 15 plus and then on page three, we have exactly
6 the same thing again, except we've broken it down
7 now into the ten plus category, into ten to 19 and
8 20 plus. And that finishes up on page five.

9 And I didn't use breakdown number
10 three.

11 Then, starting on page six, we have a
12 cross tabulation of smoking category by age, which
13 shows --

14 Q. Is that what you've continued to do with the
15 remaining breakdowns on page seven?

16 A. Yes. And this is lung cancer deaths. So,
17 you have the lung cancer death for each age category
18 by smoking category.

19 Q. What is your Exhibit Number 2?

20 A. Exhibit number two is simply a tabulation of
21 how many people there were -- how many white males
22 there were in the study in each age bracket and also
23 another breakdown that shows how many white males
24 there were who were not 50 to 74 at the start of the

Silver

1 study, which is the second table on that page.

2 Q. Dr. Silver, where are you presently employed?

3 A. I'm retired. I'm an adjunct professor at
4 Jefferson University.

5 Q. Where is Jefferson University?

6 A. Here in Philadelphia.

7 Q. What is your age, sir?

8 A. 61, going on 62.

9 Q. Where were you born?

10 A. Cleveland, Ohio.

11 Q. Where did you do your undergraduate work?

12 A. Bowling Green State University in Ohio.

13 Q. Did you earn a degree there?

14 A. Yes, I did.

15 Q. What year?

16 A. 1951.

17 Q. What was that degree?

18 A. Bachelor of arts.

19 Q. Where did you pursue -- what did you do after
20 that degree?

21 A. I went to the Ohio State University in
22 Columbus, got my master's degree in 1952 and my
23 Ph.D. in March of 1955.

24 Q. Is that from the same university?

Silver

1 A. Both from Ohio State.

2 Q. Were you on the faculty there?

3 A. Yes. Well, I don't know for -- I was an
4 assistant instructor for a quarter after I
5 graduated, between March and June.

6 Q. Where did you go after that?

7 A. To the Aeromedical Laboratory at the
8 Patterson Air Force Base in Dayton, Ohio. I guess
9 it was known as the Aeromedical Laboratory.

10 Q. Were you in the military?

11 A. Not at that time.

12 Q. How long were you at the Aeromedical
13 Laboratories?

14 A. One year.

15 Q. Doing what?

16 A. Research on a number of problems, some of
17 which concerned intelligence matters, other of which
18 concerned searches from airplanes and various
19 factors related to some visual considerations of
20 search and reconnaissance.

21 Q. What did you do after that?

22 A. I was commissioned as an officer in the
23 United States Army in 1956 and was posted to Fort
24 Sam Houston for indoctrination training and after I

Wright

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Silver

1 completed my indoctrination, I was assigned to the
2 Army Medical Research Laboratory at Fort Knox,
3 Kentucky.

4 Q. How long were you in the military?

5 A. Two years.

6 Q. Then what?

7 A. I was honorably discharged in 1958. I joined
8 the staff of the military products group of the
9 Honeywell Corporation in Minneapolis.

10 Q. How long were you there?

11 A. Until 1962.

12 Q. Then what?

13 A. In 1962, I was invited to join the staff at
14 the Franklin Institute in Philadelphia and I was
15 first senior research scientist and then I think
16 later senior staff scientist and then I was manager
17 of a laboratory until 1967.

18 Q. Then what?

19 A. I was appointed associated professor of
20 behavioral science and statistics at Drexel
21 University in '67. I was appointed full professor
22 in I think '69 but it might have been '70. And I
23 stayed on there as professor of statistics and human
24 engineering until my retirement this last year,

Silver

1 after serving a couple years as the head of the
2 department of quantitative methods.

3 Q. You retired last year?

4 A. In 1990.

5 Q. In 1990?

6 A. Yeah, September.

7 Q. Was there any mandatory retirement age?

8 A. No. You can stay. As far as I know, you can
9 stay until you drop over.

10 Q. Are you still on the faculty at Drexel?

11 A. No. I retired.

12 Q. What have you done since then professionally?

13 A. Well, I've done some consulting. I'm writing
14 a book and working on some problems in sequential
15 analysis and of course, as I told you, I'm adjunct
16 professor at Jefferson Medical University and I
17 spent a fair amount of time there consulting with
18 people on research projects.

19 I'm on the graduate faculty, again as
20 an adjunct at Penn State University and I will be
21 teaching a course in statistical quality control for
22 them some time this spring.

23 Q. What is your rate at which you charge for
24 consulting?

Silver

1 A. Oh, it depends. Generally, \$600 a day for
2 work that I can do, you know, in my home.

3 Q. At what rate are you charging the American
4 Tobacco Company?

5 MR. ECK: Objection. You haven't
6 established, for one thing, that he is charging the
7 American Tobacco Company.

8 BY MR. McCABE:

9 Q. You can answer.

10 A. I believe I'm charging them -- I believe the
11 rate that I quoted them was \$500 a day.

12 MR. ECK: I object.

13 THE WITNESS: Before I -- which was
14 before I raised my rates.

15 MR. ECK: I'd like the record to
16 reflect that he's not been hired by the American
17 Tobacco Company.

18 THE WITNESS: Well, I guess that's
19 certainly true. I've been retained by Chadbourne &
20 Parke, not by the American Tobacco. That's
21 correct.

22 BY MR. McCABE:

23 Q. How much have you charged them for your work
24 on this case?

Silver

1 A. I believe I charged them for -- \$5,000.

2 Q. When were you first approached concerning
3 this case?

4 A. Oh, my. I don't remember exactly, but I
5 would guess it was around a year and a half ago. It
6 might have even been two years.

7 Q. Who approached you?

8 A. Mr. Eck, I believe.

9 Q. Had you testified for Mr. Eck before?

10 MR. ECK: Objection.

11 THE WITNESS: I testified in a case
12 in which Mr. Eck seemed to be involved.

13 BY MR. McCABE:

14 Q. Were you retained by Mr. Eck?

15 A. I was retained by Chadbourne & Parke.

16 Q. So, you had previously been retained by
17 Chadbourne & Parke?

18 A. That is correct.

19 Q. When was that?

20 A. Three or four years ago.

21 Q. And what kind of case was that?

22 A. That was a case of somebody who was suing, I
23 think American Tobacco but I'm not quite sure, with
24 regard to I think a lung cancer.

Silver

1 Q. What were you asked to do in the previous
2 case.

3 MR. ECK: Objection. It's totally
4 irrelevant.

5 THE WITNESS: I was asked to look at
6 published data and to form a conclusion, if I could,
7 about what effect pre-1966 smoking would have had on
8 the plaintiff in that case, or what the -- or what
9 happens to risk after people stop smoking.

10 BY MR. McCABE:

11 Q. Was your deposition taken in that case?

12 A. I don't think so. I don't remember it,
13 anyway. I'm pretty sure it wasn't.

14 Q. Did you testify in that case?

15 A. Yes, I did.

16 Q. Where did you testify?

17 A. Here in Philadelphia in federal court.

18 Q. Had you testified in that case before Mr. Eck
19 approached you in the Grinnell case?

20 MR. REILLY: He's never testified in
21 the Grinnell case before today.

22 MR. ECK: That's not what he asked.
23 It asked if he testified in the prior case before he
24 was approached in the Grinnell case.

Silver

1 THE WITNESS: Oh, yeah, I'm sure I
2 ~~was~~. I think at that time I hadn't heard of the
3 Grinnell case.

4 BY MR. McCABE:

5 Q. And in the case in Philadelphia federal
6 court, you testified and American Tobacco was a
7 party?

8 A. I think that's right.

9 Q. And Chadbourne & Parke were the attorneys?

10 A. Chadbourne & Parke were surely attorneys.

11 Q. And they had retained you on that occasion?

12 A. Yes, sir.

13 Q. Have you published any articles, chapters,
14 books, on the subject matter of smoking cigarettes
15 and lung cancer?

16 A. No.

17 MR. ECK: Objection. Assumes a fact
18 not in evidence, that he's published any.

19 BY MR. McCABE:

20 Q. Do you know why you were approached or the
21 reasons you were approached on the first occasion by
22 Mr. Eck for your assistance?

23 MR. ECK: Objection. Irrelevant.

24 THE WITNESS: No. My understanding

Silver

1 is they wanted to get somebody local. The case ^{was} ~~is~~
2 being tried in Philadelphia and I take it that they
3 called the local universities and somehow got ahold
4 of me. That is my guess but I really don't know.

5 BY MR. McCABE:

6 Q. Nobody went as an in-between?

7 A. No, not that I know of.

8 Q. You just merely received a contact from
9 Chadbourne & Parke?

10 A. The first I heard of that case was Mr. Eck
11 called me on the telephone.

12 Q. You did not know him previously?

13 A. No, I didn't know him, no.

14 Q. And had you ever testified for Chadbourne &
15 Parke before?

16 A. No.

17 MR. ECK: It assumes he's testifying
18 for Chadbourne & Parke.

19 BY MR. McCABE:

20 Q. You've indicated you've given your deposition
21 before?

22 A. Yes.

23 Q. Have you testified in other trials, other
24 than this one?

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Silver

1 A. Yes, sir.

2 Q. On what subject matters have you testified?

3 A. Generally on matters involving personal
4 injuries in industrial situations, press guarding,
5 hazard analysis, that sort of thing, other kinds of
6 personal injuries.

7 Q. Do you use the ability to analyze statistics
8 in those cases?

9 A. Sometimes.

10 Q. What permits you to testify as an expert in
11 the area of hazard analysis?

12 A. I have --

13 MR. CRUSE: The judge.

14 MR. ECK: I think it was answered by
15 the attorney. The judge.

16 THE WITNESS: I have done some
17 writing in the area. I have graduate training in
18 the field of human engineering. I guess -- I don't
19 know. It seems like my training and experience is
20 relevant to the problem.

21 BY MR. McCABE:

22 Q. Okay. Have you testified in any prior case
23 in which you limited your testimony to analyzing
24 data, other than this Philadelphia case?

Silver

1 MR. ECK: Objection. It's not been
2 established that he's limited his testimony to
3 analyzing data in the Philadelphia case or in this
4 case.

5 THE WITNESS: Well, I've testified at
6 hearings where I've done that.

7 BY MR. McCABE:

8 Q. What kind of hearings?

9 A. Before the Texas Water Commission, in Nevada,
10 other places, because one of the things I do is --
11 and I've published in -- is on the analysis of
12 environmental data, especially data relating to
13 water quality. I've certainly testified in those
14 hearings. I guess they weren't really trials.

15 I testified in some trial a while
16 back involving a labor dispute in which I had
17 analyzed data and I don't remember whether I -- I
18 certainly prepared testimony but I don't remember
19 whether it went to trial or not, something involving
20 age discrimination against an insurance company. I
21 think maybe that didn't go to trial. I think they
22 settled.

23 Q. And the age discrimination case, were you
24 retained by the plaintiff or the defendant?

Silver

1 A. By the plaintiff.

2 Q. Other than age discrimination, water quality,
3 are there other areas in which you testified?

4 A. I've told you about product liability.

5 Q. Product liability, human factors.

6 A. I once testified on the probability that two
7 undertakers were cheating on the undertakers' exam
8 in New Jersey, based on statistical analysis.

9 Q. Other areas?

10 A. That's all that comes to mind now,
11 counselor. I think that's -- I think that pretty
12 well covers it.

13 MR. McCABE: That's all the questions
14 I have for you, Doctor. Thank you.

15 MR. ECK: Let's take a lunch break.

16 MR. McCABE: I object to this.

17 MR. CRUSE: We have questions that we
18 intend to ask and you're welcome to stay or not stay
19 I guess is all we have to stay about that.

20 MR. McCABE: I object to the
21 defendants taking this witness on examination. You
22 have not noticed his deposition timely and you have
23 given us no reasonable notice that you intended to
24 do so and we object to all questions asked.

Silver

1 MR. CRUSE: We don't have to give you
2 notice that we're going to ask questions. Your
3 notice is sufficient for us to ask questions.
4 You've got your objection on the record. Again,
5 you're welcome to stay or leave but I would intend
6 to ask questions in five minutes. We're going to
7 take a five-minute break.

8 (Whereupon, there was a recess.)

9

10 EXAMINATION

11

12 BY MR. ECK:

13 Q. Dr. Silver, would you please state your full
14 name for the record?

15 A. Carl A. Silver.

16 Q. How old are you?

17 A. 61 plus.

18 Q. Where do you reside?

19 A. At [DELETED]

20

21 Q. What is your present occupation?

22 A. I'm retired. I'm an adjunct professor at
23 Jefferson University and do some consulting work.

24 Q. Could you briefly describe the nature of that

Silver

1 consulting work?

2 A. Well, when requested, I do consultation on
3 human engineering or industrial safety, primarily
4 for attorneys. I do statistical analysis for --
5 primarily for companies in waste disposal business
6 and am interested in measuring chemical substances
7 or toxic substances in water and the statistical
8 problems involved in those kinds of measurements.

9 Q. Doctor, I was asking about your work at
10 Jefferson.

11 A. Oh, I'm sorry. I work with doctors and
12 nurses on various research projects, ranging from
13 asthma in inner city black kids to studies of
14 critical training for nurses.

15 Q. And what was your position prior to
16 Jefferson?

17 A. I was professor of statistics and human
18 engineering at Drexel University.

19 Q. For how long did you hold that position?

20 A. 23 years all together.

21 Q. And did you ever have any administrative --

22 A. Yes. I was the head of the department of
23 quantitative methods for about two years.

24 Q. Dr. Silver, would you go back in time and

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Silver

1 briefly describe your educational backgrounds?

2 A. I received my Bachelor's degree in 1951 from
3 Bowling Green University.

4 Q. In what subject?

5 A. In experimental psychology.

6 Q. Did you do post-graduate work?

7 A. I did. I got a master's degree in 1952 and a
8 doctorate in 1955 from Ohio State University.

9 Q. Did you have research responsibilities while
10 you were at Ohio State?

11 A. Yes. I worked with people who had a number
12 of contracts with the Air Force, at first as just a
13 general lab hand and later as the project
14 statistician for a number of projects.

15 Q. Okay. Could you briefly describe your
16 occupational history from the point where you were
17 awarded your Ph.D.?

18 A. Well, I taught the engineering psychology
19 course at Ohio State for one quarter. It was
20 roughly from March until June of 1955. I went to
21 work at Patterson Air Force base in the Aerospace
22 Medical Laboratory. I was in the visual display
23 section where my work involved problems with aerial
24 reconnaissance, decreasing the likelihood of

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Silver

1 detecting people or objects on the ground and some
2 work involving target detection for certain
3 intelligence-related activities and I was there for
4 about a year until I was commissioned as an officer
5 in the Army and after my indoctrination training at
6 Fort Sam Houston, I was sent to Fort Knox, Kentucky
7 to the Army Medical Research Laboratory where I
8 became a part of the ~~acoustics~~ ^{acoustics} laboratory and
9 conducted research on hearing over ice and snow
10 fields and I had additional duty with Continental
11 Army Command in which I was responsible for the
12 analysis of various testing data and design features
13 involving a variety of Army vehicles, especially
14 those things that are associated with armored
15 divisions and I conducted that kind of research and
16 assisted other people in analyzing their data until
17 I was honorably discharged in 1958. In '58 I joined
18 the staff at Minneapolis Honeywell, first as senior
19 research scientist and later as senior staff
20 scientist and later as manager of the human
21 engineering group.

22 Q. I believe you told me at one point that some
23 of your work at Honeywell had to do with the space
24 program?

Silver

1 A. Yes. I was part of the design team that
2 designed the displays and controls for the first
3 Mercury vehicle, Mercury capsule. I worked on the
4 design of the main battle tank and of the -- and of
5 a variety of classified munitions that were being
6 made at Honeywell and in government facilities that
7 were operated by Honeywell and assisted in the
8 analysis of data relating to the designing of
9 certain initial guidance systems, especially for
10 submarines. And I was at Honeywell until 1962 when
11 I came to the Franklin Institute in Philadelphia.

12 Q. In what capacity?

13 A. Originally senior research scientist and then
14 I was promoted to senior staff scientist and then to
15 laboratory manager.

16 My work there involved studies of
17 human performance in fatigue, a variety of factors
18 affecting the design of signing and marking for
19 highways, factors involved in highway safety in
20 overtaking and passing. I did a good deal of work
21 on military command and control systems and
22 especially the information processing requirements
23 for command and control for the sixth fleet and for
24 the second fleet and for the seventh fleet and in

Silver

1 the Pentagon for various facilities that they had
2 there, the deputy chief of staff for operations of
3 the Army.

4 Q. Okay. Did you do any work for the space
5 program there?

6 A. At the Franklin Institute, yes, we had some
7 work that was still going on with regard to -- it
8 was probably Appolo by then or maybe even -- well,
9 we had some contracts with McDonald Douglass for one
10 of the space projects but by that time I was manager
11 of the laboratory and was supervising a lot of
12 programs.

13 Q. Was it after that that you went to Drexel?

14 A. Yes, 1967 I was invited to join the faculty
15 at Drexel and I did and initially as an associate
16 professor and later as full professor and later as
17 department head.

18 I from time to time conducted some
19 research projects but mainly I taught my classes and
20 did some writing and did all the things that faculty
21 members do.

22 Q. Could you summarize some of your teaching
23 responsibilities at Drexel over the years?

24 A. Well, in addition to the human engineering

Silver

1 courses which I taught on occasion, my main
2 responsibility was for teaching statistics courses.
3 I originated and taught for over 20 years the
4 biostatistics course on the graduate level. I
5 taught I guess every undergraduate statistics course
6 and probably almost all the graduate statistics
7 courses that the department of quantitative methods
8 offered.

9 Q. We've been talking about statistics and
10 biostatistics. Just what is statistics?

11 A. Well, statistics is a branch of applied
12 mathematics. It is basically the discipline which
13 deals with summarizing and drawing inferences from
14 data by manipulating the data in various
15 mathematical ways. I mean that can range from such
16 a simple thing as finding an average value to doing
17 rather complex processing.

18 Q. What is biostatistics?

19 A. Biostatistics is the sub field of statistics
20 that deals with the life sciences. It is the
21 analysis of data related to biology of one sort or
22 another.

23 Q. Do any of those studies deal with human
24 health?

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Silver

1 A. Oh, sure. The analysis of data dealing with
2 human health is generally subsumed under
3 epidemiology, which is the study in human
4 populations of the occurrence and propagation of
5 disease and I must say that I taught the
6 epidemiology course at Drexel for I guess the last
7 decade or so. That was on a graduate level.

8 Q. Doctor, could you tell us what a statistical
9 association is?

10 A. What a statistical association is? A
11 statistical association is the tendency for one
12 variable to change in a systematic manner when you
13 change another variable.

14 Q. All right.

15 A. For example, if humidity goes up when
16 temperature goes up, then in some systematic way we
17 would say there's an association between temperature
18 and humidity.

19 Q. Dr. Silver, are you a member of any
20 professional organizations?

21 A. Yes. I'm a member of the Human Factor
22 Society, of the American Statistical Association,
23 the American Association of University Professors,
24 of Sigma Si. I think that does it.

Silver

1 Q. What is --

2 A. Not -- I'm a member of Sigma -- I said Sigma
3 Xi? That's what I meant.

4 Q. What is Sigma Xi?

5 A. Sigma Xi is an honorary association to which
6 people get elected based upon their achievements in
7 the field of research.

8 Q. When were you first elected to Sigma Xi?

9 A. Oh, my. Some time in the late '50s, I think
10 or early '60s; probably in the late '50s.

11 Q. Do you do statistical consulting work for
12 governmental or administrative agencies?

13 A. Yes, I do.

14 Q. Could you tell us a little bit about that?

15 A. Well, I've done analysis for the EPA. I have
16 served on the scientific advisory board for the EPA.

17 Q. That's the environmental protection agency?

18 A. That's the even -- yes. I've done analyses
19 for region three of the EPA. I work for the State
20 Department of Environmental Resources, done some
21 analysis for the City of Philadelphia, as well as
22 for various industrial customers.

23 Q. Okay. Dr. Silver, you've published
24 scientific articles, I take it?

Silver

- 1 A. Yes, I have.
- 2 Q. Could you tell us approximately how many?
- 3 A. Well, you have a list but there might be 340
- 4 there, perhaps.
- 5 Q. Have you presented or assisted in presenting
- 6 papers at national meetings?
- 7 A. Yes, I have.
- 8 Q. Do you also have input into published papers
- 9 on which your name does not appear?
- 10 A. Very often.
- 11 Q. And in what capacity is that?
- 12 A. Well, either as a reviewer for a journal or
- 13 often times colleagues or other people will ask me
- 14 for assistance, especially statistical assistance,
- 15 in analyzing their data.
- 16 Q. Did you indicate some of this is for
- 17 journals?
- 18 A. Yes.
- 19 Q. And could you tell us some of the journals
- 20 that you've done that for?
- 21 A. Journal of Hazardous Materials, Journal of
- 22 the Acoustical Society of America, Journal of
- 23 Statistical Society of America, probably some others
- 24 that they don't occur to me at the moment.

Silver

1 Q. And what is the object of the peer review
2 process?

3 A. Peer review?

4 Q. Yes.

5 A. Well, when someone writes an article for
6 publication, it is intended that other people would
7 rely on what was written.

8 So, before a respectable journal will
9 publish an article that people would come to depend
10 upon, they ask -- the journal editors will ask other
11 people that he believes to be well qualified to
12 review the submission, to see if it meets the
13 general standards of scientific merit, if it is
14 written clearly and if the conclusions are soundly
15 based, if the data were properly gathered, if the
16 analysis was properly carried out so that people
17 could have faith in the results that are presented.
18 Peer review just means the process by which the
19 submission is set out for -- sent out for that kind
20 of a judgment to be made.

21 Q. Dr. Silver, what did we ask you to do in this
22 case?

23 A. You asked me to form an opinion, if I could,
24 as to what role, if any, pre-1966 smoking played in

Silver

1 Mr. Grinnell's, Wiley Grinnell's lung cancer, which
2 appeared in the 1980s some time, in his death at
3 1986.

4 Q. And what did you look at in reaching your
5 opinion about Mr. Grinnell's pre-1966 smoking?

6 A. Well, I was familiar with Hammond's analysis
7 of the ACS data and that indicated to me that there
8 was a substantial decline in risk and of course the
9 surgeon general's report says the same thing.
10 There's *a decline in* ~~a kind of~~ risk for people who quit smoking,
11 so on the assumption that if he had quit in 1966, on
12 that basis I came to a conclusion that, or at least
13 a temporary conclusion that his risk would be very
14 substantially reduced. And then --

15 Q. Doctor, did you look --

16 MR. McCABE: Objection. Narrative,
17 unresponsive.

18 BY MR. ECK:

19 Q. Doctor, did you look at any original data
20 sets?

21 A. Yes, I did. In order to get data that would
22 be more -- would more nearly approximate the facts
23 of Wiley Grinnell, I reanalyzed the ACS data tapes
24 and looked at the -- at what evidence they presented

Silver

1 with regard to declining risk for people who had
2 quit smoking for various numbers of years.

3 MR. McCABE: Objection.

4 Nonresponsive.

5 BY MR. ECK:

6 Q. What are the ACS data?

7 A. American Cancer Society, through its local
8 volunteers, collected data on -- in about one
9 million Americans on their health condition, their
10 age and so on and their smoking habits back in the
11 '60s and those data have since been transcribed and
12 recorded. They amount to a prospective study with a
13 four and six-year follow up of almost -- well, about
14 one million people.

15 Q. Has the ACS study been cited in the surgeon
16 general reports on smoking and health?

17 A. Oh, yes. Many times.

18 Q. And could you describe something about how
19 the ACS study was conducted?

20 A. Well, local volunteers were given
21 questionnaires and were asked to get people of their
22 general acquaintance or whoever else they could to
23 fill out those questionnaires with regard to various
24 personal information, age and smoking history and

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Silver

1 things of that nature and their health status and
2 four and six years later they were asked to fill
3 those out again. Of course, if somebody had died in
4 the meantime they were asked to supply the date at
5 which that person had died and otherwise they filled
6 out the questionnaire and resubmitted the new
7 questionnaire.

8 Q. How did you get the ACS data?

9 A. They were furnished to me on three rolls of
10 magnetic tape by you.

11 Q. And is that the type of data that you
12 normally would analyze in your profession as a
13 statistician?

14 A. Well, yes. It's the largest data set I've
15 ever looked at but other than that, this is the sort
16 of data that I generally look at.

17 Q. It's your understanding that Hammond, you
18 referred to earlier, had analyzed the ACS data as
19 well?

20 A. Oh, yes. Absolutely. He analyzed the same
21 data.

22 Q. And were you able to satisfy yourself that
23 the data you had was in fact the data Hammond had?

24 A. Well, I'll give you a qualified yes. I

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Silver

1 repeated his analysis as close as I could and I got
2 practically the same results. It is evidently the
3 case that the data I have, have a few more cases on,
4 have been added to the data sets since his analysis
5 was published but with the exception of the fact
6 that I have a little more data than he had, it's the
7 same data set.

8 Q. Doctor, did you reach an opinion concerning
9 whether Mr. Grinnell's pre-1966 smoking posed a risk
10 from his lung cancer in 1986?

11 A. Yes.

12 Q. Could you state your opinion for the jury?

13 A. Yes. His pre-1966 smoking had constituted no
14 risk factor at all with regard to his death in 1986.

15 Q. What is the basis for your opinion?

16 A. Well, in 1986 -- this is 20 years after
17 1966 -- and my analysis goes out to 15 years
18 stopping smoking and the first thing I should say is
19 that my analysis and Hammond's analysis also, and I
20 guess every other analysis of these data shows that
21 the more time that goes by since a person quit, the
22 lower the risk factor.

23 Q. Okay. Could you explain to the jury how the
24 risk of dying from lung cancer is quantified in your

Silver

1 analysis?

2 A. Yes. Well, the standard way is you find --
3 you have to understand the concept of a person
4 year. A person year is what you get if you follow
5 one person for one year. So, if you follow five
6 people for one year you'll accumulate five person
7 years. If you follow two people for five years
8 you'll accumulate ten person years and so on.

9 The annual risk is defined as the
10 number of deaths that occur over a period of time
11 divided by the number of person years. And that
12 annual rate has to be adjusted for the number of
13 people in the age category in the sample and when
14 you get all done with that, you look at nonsmokers
15 and you find what their annual risk is of dying of
16 lung cancer between any particular age.

17 MR. McCABE: Objection. Narrative
18 and nonresponsive.

19 BY MR. ECK:

20 Q. Go on, Doctor.

21 A. And the risk for a nonsmoker is defined as
22 one.

23 MR. McCABE: Objection. It did not
24 ask for a specific request. Narrative.

Silver

1 BY MR. ECK:

2 Q. These are called risk ratios?

3 A. I haven't gotten to them yet but I'm on the
4 way.

5 Q. I'm sorry.

6 A. You then do exactly the same calculation for
7 people who have stopped smoking for any particular
8 period of time, like ten to 14 years and you find
9 the annual risk for those people and you divide that
10 by the annual risk for the nonsmoker and that ratio
11 is the risk ratio.

12 So, if that ratio is one, that means
13 that a person has just the same risk as a
14 nonsmoker.

15 If it's greater than one, it means
16 that that person has more risk than a nonsmoker and
17 if it's less than one, he has less risk than a
18 nonsmoker.

19 MR. McCABE: Objection. Not
20 responsive to any question.

21 BY MR. ECK:

22 Q. Doctor, could you describe your analysis for
23 the jury?

24 A. Yes. I used the ACS tapes to count the

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Silver

1 number of white males who were either nonsmokers or
2 smokers of one to 19 or 20 or more cigarettes per
3 day and I counted them and I classified them as
4 either nonsmokers or current smokers or people who
5 had quit for less than one year or for various other
6 times like one to four years, five to nine years and
7 so on.

8 And then I counted the number of lung
9 cancer deaths and the number of person years for
10 people in each of those categories and the rest was
11 arithmetic.

12 MR. McCABE: Objection. Called for a
13 narrative response.

14 BY MR. ECK:

15 Q. Is that the same analysis that Dr. Hammond
16 performed?

17 A. Yes, it's the same analysis that Dr. Hammond
18 performed.

19 Q. What were the results of your analysis for
20 smokers who quit for 15 or more years?

21 A. Smokers who quit for 15 or more years have a
22 risk ratio that was less than one. It was about
23 point seven.

24 Q. What does that tell you about Mr. Grinnell's

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Silver

1 risk if he quit smoking 15 years thereafter?

2 A. He would have had no more risk, in fact he
3 would have had less risk than a nonsmoker of the
4 same age and sex.

5 Q. Dr. Silver, are you aware of any statistical
6 evidence upon which one could base a conclusion that
7 Mr. Grinnell's smoke prior to 1966 was a
8 contributing factor in his death from lung cancer in
9 1986?

10 A. No, I'm not aware of any such evidence.

11 Q. Dr. Silver, based upon everything you've read
12 and reviewed that pertains to this issue, and upon
13 the analysis that you have performed and described,
14 do you have an opinion with a reasonable degree of
15 scientific certainty concerning Mr. Grinnell's risk
16 of dying from lung cancer in 1986 if he quit smoking
17 permanently in 1966?

18 A. Yes, I have an opinion.

19 Q. And what is it?

20 A. My opinion is his pre '66 smoking would have
21 been no risk factor at all for his dying of lung
22 cancer 20 years later.

23 Q. And his risk of dying from lung cancer in
24 1986 would have essentially have been the same as if

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1 he never smoked?

2 A. That is correct. It would have been the same
3 or less than that of a nonsmoker.

4 Q. Doctor, have you summarized the results of
5 your analysis in written form?

6 A. Yes, I have.

7 Q. Is this the summary of your analysis?

8 A. Yes, it is.

9 MR. ECK: Let's mark these as four,
10 five and six.

11 (Whereupon, the exhibits were marked
12 Silver-4, 5 and 6 for identification.)

13 BY MR. ECK:

14 Q. Doctor, could you describe for the record
15 Exhibit 4, Silver-4?

16 A. This is a report dated the 14th of December,
17 1990, which shows the risk ratios for people who
18 have quit smoking for various periods of time. The
19 results are presented in the same way as the -- as
20 that from the 1985 report to the surgeon general in
21 table 70 page 225.

22 They are really the same as Hammond
23 presented, except that I have broken up the ten plus
24 category into ten to 14 and 15 plus.

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1 MR. McCABE: Objection to Exhibit
2 Number 4. That is a document that has not
3 previously been provided to the plaintiffs. It
4 bears a date that we have received no such document
5 on. We asked the doctor for his data earlier and he
6 did not produce it at that time. It was not
7 produced as a report and it was not produced as a
8 supplemental report by the defendants.

9 MR. REILLY: You're wrong, Roger.
10 That was sent to your office in December.

11 MR. CRUSE: Are you putting on the
12 record that you don't have a copy of the report,
13 Roger, so we'll be clear?

14 MR. ECK: Not that one. The other
15 one.

16 BY MR. ECK:

17 Q. Doctor, does this document marked Exhibit 4
18 summarize the results of your own analysis of the
19 ACS data?

20 A. Yes, it does.

21 Q. Doctor, could you identify what has been
22 marked as Silver-5?

23 A. Yes. This is a report dated December 19th,
24 1989 in which I report on my reading of the

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1 literature with regard to declining risk after
2 cessation of smoking. This was done prior to my
3 having completed the analysis of the ACS tapes.

4 Q. Is it a summary of your opinion on those
5 issues at that time?

6 A. Yes, it is.

7 Q. And how many pages does it consist of?

8 A. It consists of two pages.

9 Q. Doctor, could you identify what has been
10 marked as Silver-6 for the record?

11 A. It's a copy of my resume, dating back at
12 least before September of 1990, because it says
13 present professor of statistics. I retired as of
14 September of 1990.

15 Q. And your testimony earlier would update that
16 resume?

17 A. That is correct.

18 Q. Doctor, I believe that you were asked earlier
19 whether or not ETS would have any impact upon the
20 risk of smoking for nonsmokers in the studies that
21 you looked at. I'd like to ask you a slightly
22 different question and that is would any effect of
23 ETS on lung cancer risk affect your analysis?

24 A. No. Whatever general effects there are of

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1 any general environmental effects of any sort would
2 affect smokers and nonsmokers both and consequently,
3 would be accounted for in the analysis.

4 Q. Dr. Silver, you were also asked earlier
5 whether or not the risk of smoking for 40 years, the
6 risk of lung cancer posed by smoking for a 40-year
7 period would generally, all other things being
8 equal, be greater than the risk of smoking for a
9 20-year period. I'm going to ask you a slight
10 variation on that question.

11 I'm going to ask you if the end of
12 the period of smoking, the 20-year period and the
13 40-year period were at the same age, 50, 55,
14 whatever, would your answer be the same?

15 A. Well ---

16 Q. Do you understand the question, Doctor?

17 A. Yes. My answer certainly wouldn't be the
18 same. Really, it would be very difficult to answer
19 the question because if somebody smoked for 20 years
20 and stopped at age 50, he would have had to start
21 smoking at age 30 and there's not much data about
22 people who start smoking at age 30.

23 It's pretty hard to separate the
24 effect of age from the effect of duration of

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1 smoking. Based on something like that, I don't
2 think that you could say, if they both stopped
3 smoking, both finished at the same age, I think you
4 wouldn't find any difference in risk.

5 MR. ECK: I will pass the witness.

6 MR. McCABE: We again place on the
7 record our objection. There has been no notice
8 provided to me of the intent of the defendants to
9 take this deposition. Judge Thomas held a hearing
10 on this subject and he very specifically ordered
11 that in the event that the defendants were going to
12 present testimony in a trial form at deposition that
13 they were required to give appropriate notice to the
14 plaintiffs and that the plaintiffs were entitled to
15 their discovery deposition and then and only then
16 were the defendants permitted.

17 Furthermore, the defendants have
18 failed to provide reasonable notice, despite Judge
19 Thomas's ruling, for the taking of this deposition
20 and the defendants have failed to produce the report
21 of Dr. Silver, which they are now relying upon and
22 have attached as Exhibit 5. The plaintiffs are not
23 prepared to go forward with cross-examination of the
24 witness and reserve all cross-examination to the

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1 time of trial.

2 MR. CRUSE: First of all, on behalf
3 of the defendants, I want to put on the record that
4 Mr. McCabe completely mischaracterized what Judge
5 Thomas's ruling was on these matters, that we have
6 in all respects complied with Judge Thomas's ruling
7 and at no time did Judge Thomas ever order that we
8 were not allowed to ask questions of any witnesses
9 who were deposed. The only thing that he did say is
10 that the plaintiffs were entitled to question him
11 first, which they did now. And that's all we have
12 for the record.

13 MR. ECK: I'd like to clarify that I
14 think that your complaint is about what has been
15 marked as Exhibit 4, not 5.

16 MR. McCABE: The report of December
17 14, 1990 that has not previously been produced.

18 MR. REILLY: Which you claim has not
19 been produced.

20 (Whereupon, the deposition concluded
21 at 1:00 p.m.)
22
23
24

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C E R T I F I C A T E

I hereby certify that the proceedings and evidence noted are contained fully and accurately in the notes taken by me on the deposition of the above matter, and that this is a correct transcript of the same.

Russ H. Beaver

(The foregoing certification of this transcript does not apply to any reproduction of the same by any means, unless under the direct control and/or supervision of the certifying reporter.)

ACKNOWLEDGEMENT OF DEPONENT

I, Carl A. Silver, do hereby certify
that I have read the foregoing pages, 1 through 93
and that the same is a correct transcription of the
answers given by me to the questions therein
propounded, except for the corrections or changes in
form or substance, which I have made and initialed
therein.

19 March 91 Carl A. Silver

DATE

Subscribed and sworn to before me this 19th day
of March, 1991.

My commission expires:

Notarial Seal
Ann M. Penrose, Notary Public
Barber's Boro, Montgomery County
My Commission Expires Dec. 2, 1991

Member, Pennsylvania Association of Notaries

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